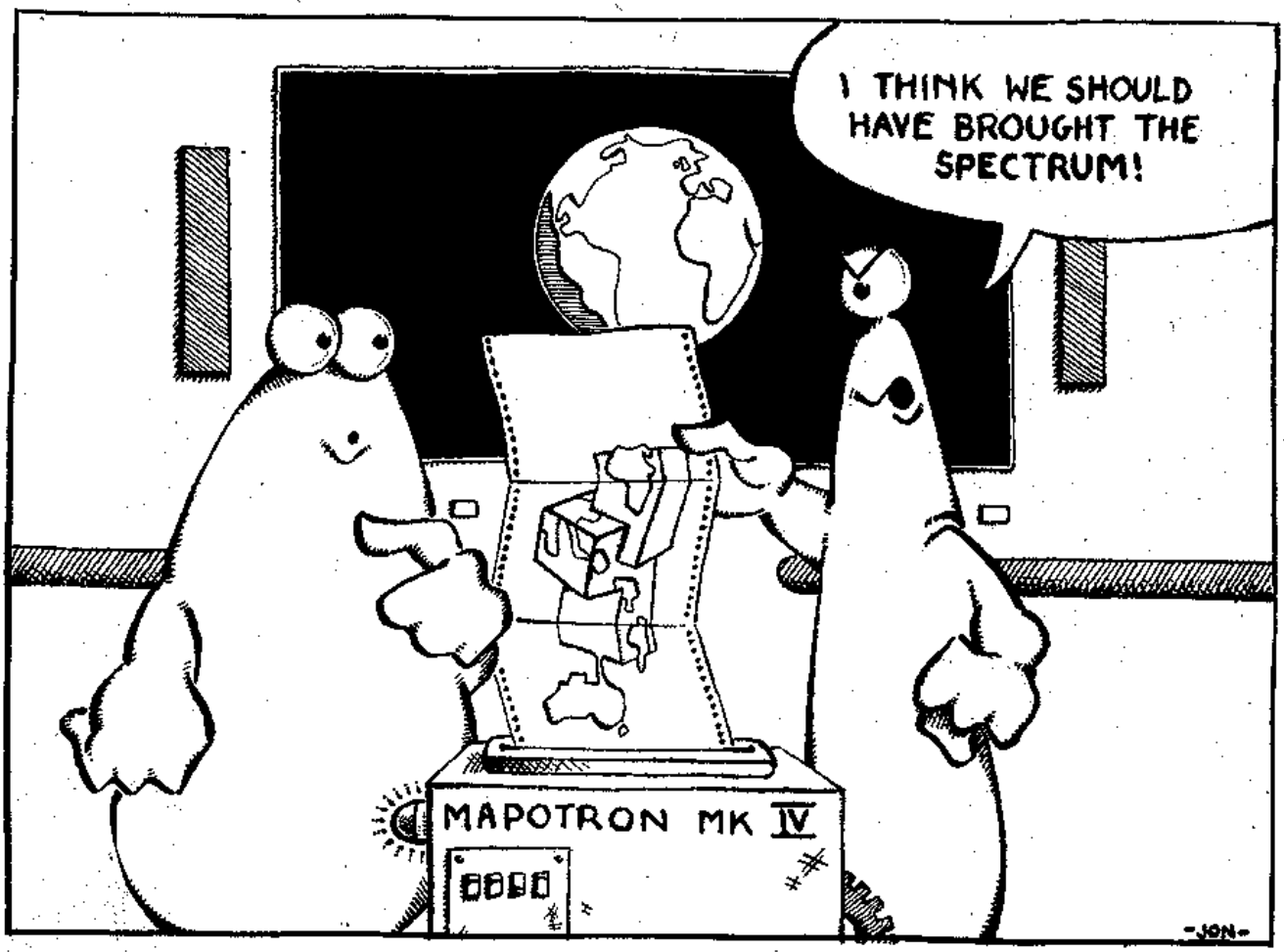
Vol 3 – No 3. November 1989.

FORMAT

FOR SPECTRUM USERS



SPECTRUM MAP MAKING

MILES GORDON TECHNOLOGY plc

GRAND PRE-CHRISTMAS, PRE-SAM SALE!

The SAM Coupe is just around the corner. November 20th - that's the date when we expect to be sending out the first computers. It's all great news.

BUT we've got a problem. The warehouse where we keep most of our current stock has got to be cleared so that we've got room for the Coupe.

That's tough for us - and great for you! What it means is that we're able to offer you INDUG members fantastic savings on a whole range of products.

So what's in the warehouse? We've got:

- PLUS Ds
- Fixers
- LC-10 and Citizen printers, ribbons and interfaces
- Vidi-ZX, RAM Turbo and other interfaces
- Disk drives - Lifetimes, PC internal and external
- PLUS D and other software

and much much more...

And we're offering 20% OFF all our standard prices - to INDUG members only. That's only £47.96 for the PLUS D, £103.96 for the Lifetime Drive!

But you'll have to hurry, because we're holding limited quantities only of some of the stock - and once a line is finished, we don't intend to re-order. If you'd like a copy of our latest price-list - or if you wish to place an order - please contact our Customer Care Department on 0792 - 791100, and they'll confirm that the item you want is in stock: it's strictly first come, first served.

We look forward to your call.

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NEWS ON 4

PSION LAUNCH LAP-TOP.

As predicted last month, PSION launched a new range of IBM compatible lap-top machines at the recent Personal Computer Show in London . Starting at £545 for the MC200 and going up to £1500 for the MC600 the computers bridge the gap between Psion's long standing Organiser range and larger office machines.

Only the MC600 is fully MSDOS compatible but the other two machines in the range have built-in software which is file-compatible with major MSDOS programs.

NEW LEISURE SHOW.

EMAP, publishers of ACE, The One, Commodore User and Sinclair User, are planning a new autumn show for 1990. The show, grandly titled 'The European Computer Entertainment Show' is scheduled for mid September and will be dedicated to the games and leisure sector. More details when EMAP feel confident enough to hand them out.

SoSA FORMED.

A group of programmers has got together to for the Society of Software Authors. The new group aimed at programmers, graphic artists, musicians and designers who are active in the entertainment software industry.

Their first project is a survey which looks what programmers are doing and what they intend to do in the future. The disappointing side is that they do seem to be rather biased towards the 16 bit market. For more details telephone 0672 810426.

MAJOR DISTRIBUTOR SHUTS.

Microdealer, one of the oldest and at one time the largest distributor in the leisure software market, has been closed down. Rumours had been going round for some time that Mirror Group Holdings, Microdealer's parent company, were looking for a buyer for the distributor.

Microdealer was offered both to UK and overseas companies but there appears to have been little interest. Lee Ginty, Microdealers long-serving managing director, is believed to have tried to organize a management buy-out but, by mid September, this seems to have fallen through.

It seems unlikely that the loss of Microdealer will affect the availability of games in the UK, there are many other distributors who will fill the gap. But it does indicate that the hay-day of software distributors may be over.

SAM AVAILABILITY.

It looks like Santa will be loaded down this year. MGT hope to start shipping SAM Coupe computers at the end of November so the Christmas holiday should be full of delights for many people.

Brochures will be send out, to people who registered an interest in SAM, during the first two weeks of November and MGT are clearing the decks for the flood of orders that will result. If you have not already done so, call MGT on 0792-791100 to get your name on their list.

SAM AT THE BARBICAN.

The SAM Coupe will be on show at the Education Show to be held at the Barbican Centre in London from the 17th to the 20th of January.

When asked Alan Miles said "MGT is keen to promote SAM into Primary education and we see this show as an important step in the right direction".

Anyone go to the PC show at Earls Court? Well if you didn't you missed nothing. I can remember the early days of the Personal Computer World Show, organized on a budget and attended by hordes of enthusiasts. The show grew and grew until it arrived at Earls Court two years ago. At one time it was considered as the National computer show, the one the whole world flocked to see.

Now the same boring companies trot-out the same boring products year after year. Britain led the computer revolution (by a long way when it came to home computers) but now presents a very lack-luster image. The V.I.P. lounge at this years show was small, dirty and had no facilities at all. The PC show is very expensive to exhibit at and also expensive to attend unless you are lucky enough to get a trade ticket. Let's hope the Computer Shopper Show (Nov 24-26) will give us a show with more life and originality, they curtanly can't do any worse.

With SAM on the way, and with FORMAT getting ever bigger, expansion is underway here in Gloucester. In the next few months I will be more than doubling office space so that staff can be taken on (if I can find the right people). Rewiring and conversion work is already underway but extensive work is still to be done. I'm explaining this because it will at times affect the telephone HELP LINE (I can't answer the phone and do building work at the same time) so please avoid ringing at weekends if you can, and definately no calls on a Sunday. During the week the HOTLINE will still be available from 2pm to 6pm and 7pm to 9pm.

Our Autumn subscription drive is still running and, along with the introductions, several readers have sent in more ideas for expanding circulation. Two enterprising readers have put up notices in their local librarys asking Spectrum users to contact them. Another used the 'Customer's Notices' board at his local supermarket, you just fill out a card and it stays on the board for about two weeks and most supermarkets don't charge for the service. I have also had an overseas subscriber point out that FORMAT can prove expensive in some countries. It's not the yearly subs that cause the problem but the bank charges for the Sterlin cheque which may add as much as 60% to the cost. His suggestion is to appoint overseas agents who will accept money in local currency and then do one conversion and one cheque so saving many costs. Well I think that is an excellent idea, I did briefly do something of the sort with Sweden when DUGOS was going, so if anyone is interested in becoming an agent then give me a ring or drop me a line.

Finally, I am thinking of organizing a One Day Workshop in Gloucester next February. The workshop will serve as a meeting place for FORMAT readers and there will be several speakers covering a wide range of subjects relating to the Spectrum and SAM computers. Cost should be about £15 but before I can book a venue and fix a final price I need to know how many people to allow for. If you would be interested in attending please drop me a line, without obligation, (mark the envelope 'WORKSHOP') and if there is enough support then I can start making firm plans.

Bob Brenchley. Editor.

YOUR LETTERS

STAR*LETTER* *STAR*LETTER

Dear Editor,

I am working with the Hisoft Pascal complier (v1.7) and am very satisfied with it - except for one problem. If you compile a source text and save the resulting code file automatically, using the T command of the editor, then the stand-alone machine code program will occasionaly crash. Ray Williams mentioned the same problem in his article in Vol 2 Issue 9.

First I looked for bugs in my Pascal source, but I couldn't find any. Strangely the crashes disappear, if something is changed in the source code, only to reappear again if more changes are carried out. I can't find any relation between the changes and the crashing and, as the same occurs with the microdrive version, I can only assume a bug in the SAVE routine of the T command.

I'm glad to say though that there is a way to overcome the problem. After the automatic SAVE using the T command you are dropped into Basic. Now CAT your disc and keep a note of the Start address and Length of the code file you have just SAVEd. Add about 10 bytes to the length figure. Now type SAVE d*"filename" CODE Start,Length as a direct command, this will save a working version of your object code.

You see, only the copy of the file saved to disc has been corrupted, the version still in memory is untouched (you can prove this by starting the program with RANDOMIZE USR Start).

I have sent some sample programs to Hisoft to demonstrate this effect, let's hope they find the bug soon.

Yours Sincerely, Martin Hofbauer.

Thanks Martin, lets hope your efforts will help other Pascal programmers. ***Ed.***

Dear Editor,

In recent years we have seen many of the great magazines of the past fold. Your Computer, ZX Computing and Computing Today (to name three) have all vanished.

It strikes me that many newcomers to computing will have missed the opportunity to read some of these old favourites. They were full of articles that (like FORMAT) treated users as intelligent adults. Would it not be possible to reprint some of these old articles? I feel new users would benefit.

Yours Sincerely, Keith Lister.

Copyright in articles printed in magazines may rest with the publisher or with the author. I have already re-printed some articles, like the early ones in the series by Clyde Bish, which originally appeared in ZX Computing. Clyde retained copyright on his articles and, after updating some, allowed FORMAT to print them.

Before we could consider an old article, and I do agree there would be interest and demand in some areas, I would need to track down the author. I have long wanted to contact Toni Baker and several others, but tracking them down is very difficult. If anyone has any addresses then please let me know and I will see what I can do. ***Ed.***

Dear Editor,

A tip for printer users. As my printer has a friction feed, as well as tractor feed, I can get double the mileage with paper. Most lines of a program are less than 32 characters long so I cut a pile of fan-fold paper in half vertically, set the line length to 32 (the same as the Spectrum's screen, and then I have two piles of paper to use.

Yours Sincerely, Keith Lister.

Letters printed may be edited for length or clarity. The writer of each months STAR LETTER wins an EXTRA 6 months subscription to FORMAT.

SHORT • SPOT

By: John Wase.

It really serves me right. It looked good, the principle is obvious (copy to RAM disc), so I never checked Daniel Neidle's copy program (August "Format). And the post keeps coming in. Please, if you have a problem with the copy program, drop me a line as I've now got access to a working version. I hope to answer all letters shortly, but they all rolled in at the start of term, so I shall need some time.

Just to show I have some faith in Daniel's abilities, here is a further program (which I've checked) which does a sideways posterprint. Yes it does work. No, it doesn't if your printer DIP switch is set for no automatic linefeed with carriage return: then it prints everything in the same place and no amount of POKEing at eight seems to help. Here is Daniel's listing.

```
 10 REM Sideways posterprint
 20 REM DM Neidle, July 1989
 30 :
 40 INK 7: BORDER 0: PAPER 0: CLS : B
    RIGHT 1
 50 PRINT AT 0,6;"Sideways Text Print
    er"; OVER 1;AT 0,6; INK 6;"_____
                  "
    _____________
 60 PRINT''"Input text to be printed"
 70 INPUT  LINE A$: IF A$="" THEN GOT
    O 70
 80 LET LE=LEN A$
 90 PRINT AT 7,0;"Characters ";LE;" "
100 LET N=INT (LE*2-1): PRINT '"Lengt
    h     ";: GOSUB 330:: PRINT " inc
    hes"
110 LET N=INT (LE*5-2): PRINT "
          ";: GOSUB 330: PRINT " cm"
120 LET N=INT (LE/5.5+.9): PRINT "
             ";: GOSUB 330: PRINT " pa
    ge";("s" AND N>1);" "
130 IF LE<>LEN A$ THEN RETURN
140 PRINT AT 13,0;"Typeface": INPUT
    LINE I$: LET CH=0: IF I$="" THEN
    LET T=60: LET CH=1: GOTO 160
150 LET T=200: LOAD d1;I$CODE 51200,2
    55*8
160 PRINT AT 13,11; INK 6;I$;("normal
    " AND I$="")
170 PRINT AT 16,11; INK 6; PAPER 2; F
    LASH 1;"All ok?": PAUSE 0
180 IF INKEY$<>"y" THEN IF INKEY$<>"Y
    " THEN IF CODE INKEY$<>13 THEN RU
    N
190 PRINT AT 16,11;"          ": LET M$
    =A$: LET A1=999
200 LET C$="": FOR I=1 TO 9: LET C$=C
    $+CHR$ 219: NEXT I
210 FOR Z=1 TO LEN M$: IF M$(Z)=" " T
    HEN LPRINT '': GOTO 310
220 FOR B=7 TO CH STEP -1: LET L$=""
230 POKE 23607,T: LET P=PEEK 23606+PE
    EK 23607*256+8*CODE M$(Z)+CH: POK
    E 23607,60: FOR J=1 TO 8-CH: LET
    A=PEEK P: IF A1=A THEN LET P$=Q$:
     GOTO 270
240 IF A=0 THEN LET p$="          ": G
    OTO 270
250 FOR I=7 TO B+1 STEP -1: LET A=A-(
    (2^I) AND A>=2^I): NEXT I
260 LET P$=(C$ AND A>=2^B)+("
     " AND A< 2^B)
270 LET L$=P$+L$: LET P=P+1: LET Q$=P
    $: LET A1=A: NEXT J
280 IF L$<>"

                  "( TO 72) THEN LPR
    INT "   ";L$'"   ";L$: REM If you
     want proportionally spaced lette
    rs
290 REM Otherwise delete the REM and
    use this line:LPRINT "   ";L$'"
     ";L$
300 NEXT B
310 LET LE=LE-1: IF Z<LEN M$ THEN GOS
    UB 90
320 LPRINT '': NEXT Z: STOP
330 PRINT  INK 6;("0" AND N<100);("0"
     AND N<10);N;: RETURN
```

Incidentally, it prints by copying the screen using an italic square bracket for each pixel. Then it gives a linefeed. This gives characters

which are rather light, rather tall and rather thin. Initially, it uses the Spectrum character set, but there is provision for loading your own - useful if you have Simon Turton's "Compositor" or Bradway Software's "Lettahead", for both these are full of fonts.

Perhaps someone could come up with patches which could, say, download a complete (printer) character square of black into the printer (not all printers will do this, though), printing this for each pixel. Oh, and then print it again, otherwise the final letters will be totally out of proportion. You will need to cut down the size of the line feed, too, to match. And then a patch to copy half-size would be nice.... Come on, "Format" readers - this looks like one which will run and run.

My prolofic correspondent Harold Burton invariably comes up with real short-spot stuff - often one-liners. Here's a long program (a two-liner) of his for "Masterfile" with the Disciple or +D interface. Now, these need some alterations to work with these interfaces and if one merely amends line 4010 with "COPY SCREEN$", all 24 lines of each page are printed out; not just the file information from each page. Harold's new line 4010 takes care of this by using INPUT which prevents the bottom two lines of the screen from being printed. For more than one page, there is a gap of two lines between each page and the next, so a reverse line feed is used before the start of each page after the first. This works fine if each record occupies either one or two lines. CHR$ 27, 106, 51 can be altered or set to zero to suit other record sizes. Finally, line 4900 can be inserted to set the printer margin and the perforation skip for 11 inch paper. From main menu, select "U", confirm, wait a second or two, then proceed.

```
4010 POKE @ 6,1: INPUT ;: SAVE SCREEN$
     : LPRINT CHR$ 27; CHR$ 106; CHR$
     51;: INPUT ;: POKE @ 6,0: GOTO U
    SR r
```

```
4900 PRINT AT 10,9;"WAIT A LITTLE": PO
     KE @ 6,1: LPRINT CHR$ 27; CHR$ 64
     ; CHR$ 27; CHR$ 108; CHR$ 15; CHR
     $ 27; CHR$ 67; CHR$ 0; CHR$ 11; C
     HR$ 27; CHR$ 78; CHR$ 8; POKE @ 6
     ,0: GOTO USR r
```

(I've not been able to try this one, so give no guarantees, but Harold's programs usually work!)

You know, disc drivers are funny things, nearly as silly as printers. The ones with which I am most familiar are the Discovery and the +D, and both have unique features to delight and irritate. The principal irritation with the +D is the very close aping of the copy routine with that of the microdrive. So MOVE will copy neither opentype nor microdrive files from drive 1 to 2: moreover the SAVE...TO routine resets the Spectrum after each file. MOVE, however, works fine with Discovery: this also has the command MOVE "d";1 TO "d";2 to MOVE everything from one disc to another. But if (as I do) you use discs of two different sizes, you get the undocumented error message "wrong disc"..... You must MOVE each file individually. And if you print a stream to a stream, the error message then is "Don't be a wally".... These disc units. Currently, I am looking at "Profile", a program which will copy everything on the +D - I'll let you know how I get on next month. Oh, and when SAM at last emerges, we shan't have any hassle with that disc copy routine, so I am told... Let's see...

Best wishes for now. John Wase.

- - - - -

Contributions to SHORT SPOT should be sent direct to:-

John Wase,
Green Leys Cottage,
Bishampton,
Pershaw,
Worcs,
WR10 2LX.

Please enclose a stamped addressed envelope if you want any discs or tapes returned.

AVERAGES

By: Derek Morgan.

This is a program for calculating averages. The reason behind it is the fact that, being a competition secretary, I needed a easy method to convert scores to averages for a number of people and then sort them into order before printing them out.

The program is fairly straight forward. The Headings I have entered as strings but these could just as easily be an INPUT or a PRINT Statement.

It now asks how many peoples scores to be entered and then the number of scores For and Against for the first person. Each score is entered individually. When all the scores have been entered the totals For, Against and the Average is printed to the screen with a query as to whether this is correct.

If **NO** then it's back to the start of entering the scores. If **YES** then you are prompted to enter The Players Name followed by the FOR / AGAINST and AVERAGE scored, the AVERAGE can be to as many decimal places as you wish. At the end of this it's back to ask how many numbers of scores for the next player. When all the scores have been entered you are asked which field you wish to sort by, Name / For / Against / Average, and whether a printout is required. On completion of this you can resort by answering Yes to the question.

Thats about all there is to the program. I hope other people find a use for it.

```
  1 REM AVERAGES BY D.J.MORGAN
  4 REM T$ & C$ could be INPUT or PRI
    NT statements
  5 REM if STOPS during sort with dat
    a GOTO 214
  6 LET T$="BRIDGEMARY B.C.": LET C$=
    "SUNDAY SNOWBALL AVERAGES"
 10 PRINT TAB 10;T$;'';TAB 6;C$
 40 PRINT '''HOW MANY RECORD"
 50 INPUT N
 60 CLS
 85 REM INITILISE ARRAYS
 90 DIM N$(N,8,15)
100 DIM K$(N,15)
110 DIM X(N)
120 REM INPUT RECORDS
130 FOR R=1 TO N
140 PRINT "ENTER SCORES FOR RECORD ";
    R
141 INPUT "HOW MANY PAIRS OF SCORES "
    ;S
142 PRINT "NUMBER OF SCORES TO ENTER
    ";S
143 LET A=0
144 LET C=0
146 FOR L=1 TO S
149 INPUT "ENTER SCORE FOR ";B
151 PRINT B;",";
152 INPUT "ENTER SCORE AGAINST ";D
155 PRINT D;","
158 LET A=A+B
161 LET C=C+D
164 NEXT L
167 LET Q=(A*100)/(A+C)
171 PRINT "FOR ";A;" AGAINST ";C;" ";
    Q;" %"
173 PRINT AT 16,1;"IS THIS CORRECT?"
176 INPUT Z$: IF Z$="N" THEN CLS : GO
    TO 141
190 FOR I=1 TO 4
191 IF I=1 THEN PRINT "NAME ";
192 IF I=2 THEN PRINT "FOR ";
193 IF I=3 THEN PRINT "AGAINST ";
194 IF I=4 THEN PRINT "AVERAGE ";
200 INPUT "ENTER SINGLY ";N$(R,I)
205 NEXT I
207 CLS
210 NEXT R
213 REM SORTING
214 PRINT "WHICH FIELD DO YOU WISH TO
     SORT 1 TO 4  ";
215 INPUT F
216 PRINT F
218 PRINT "DO YOU WISH TO FOR A PRINT
     OUT   Y/N"
```

```
220 INPUT J$
224 IF J$="Y" THEN POKE @6,1
226 FOR R=1 TO N
230 LET K$(R)=N$(R,F)
240 NEXT R
250 GOSUB 900
270 PRINT "SORTED RECORDS ARE:"
280 PRINT : IF J$="Y" THEN LPRINT CHR
    $ 27;CHR$ 14;"          ";T$
283 IF J$="Y" THEN LPRINT
285 IF J$="Y" THEN LPRINT ;"
                    ";C$
287 IF J$="Y" THEN LPRINT
290 IF J$="Y" THEN LPRINT "NAME
          FOR            AGAINST
         AVERAGE %"
295 FOR R=1 TO N
300 FOR I=1 TO 4
310 PRINT N$(X(R),I);" ";: IF J$="Y"
    THEN LPRINT CHR$ 27;CHR$ 0;N$(X(R
    ),I);" ";
320 NEXT I
330 PRINT
335 IF J$="Y" THEN LPRINT
340 NEXT R
350 PRINT
360 PRINT "DO YOU WISH TO RESORT? Y/N
    "
370 INPUT Y$
380 IF Y$="Y" THEN CLS : GOTO 214
390 STOP
890 REM SORTING ROUTINE
900 FOR A=1 TO N
910 LET P=1
920 FOR B=1 TO N
930 IF K$(A)<K$(B) THEN LET P=P+1
940 IF K$(A)=K$(B) THEN GOTO 960
950 GOTO 970
960 IF A<B THEN LET P=P+1
970 NEXT B
980 LET X(P)=A
990 NEXT A
1000 RETURN
```

P.S. Has anybody found out how to save and reload the SCRABBLE 128 yet?

MAP DRAWING WITH A SPECTRUM

By: Grant Dixon.

An interest in the reception of weather satellites gave rise to the idea of drawing a map on the Spectrum screen on which the satellite's track could be displayed. As a first effort I produced a map of the Northern Hemisphere as shown at the top of this page. The north pole is at the centre of the circle and the circumference represents the equator. The radial distance is divided by 90 to give equally spaced degrees of latitude, thus the diagram is not quite the same as you would get if you were in outer space looking down on the north pole. From such a position your picture would be rather cramped in the equatorial region due to the curvature of the earth.

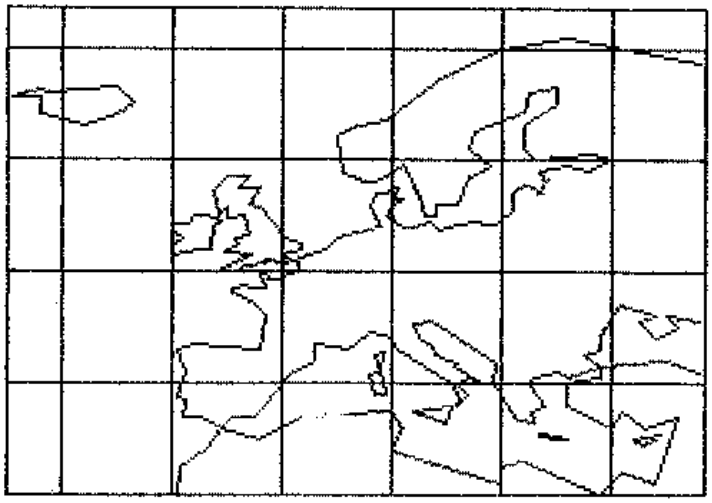

Fig 2.

My second map was to show Europe so that a more accurate assessment of the satellite's position could be made. Fig.2. shows how this appeared using a rectangular grid to represent latitude and longitude and it is quite clear that the countries in the northern latitudes are very distorted in area, appearing to be much larger than they really are. Of course this is due to the age old problem of trying to put on a flat sheet of paper what actually exists on a spherical surface. Fig 3 shows how a compromise was reached by using a conical projection which gives a more natural appearance to the northern regions.

To draw the map one needs to know the latitude and longitude of a series of points which make up the required coastline. This information is stored in a series of DATA statements from which it is read, processed and plotted. It certainly is a rather tedious business getting the required information from an atlas, but it has to be done ! Select a starting point and work your way along the coastline noting the prominent features and remembering that the final result is going to be a series of straight lines joining the chosen points. If the points are too far apart you will get a spiky, geometric sort of map, if the are too close together you may find that the Spectrum may not be able to plot the fine detail.

Now to draw the map on the screen .... let us take the hemisphere map to begin with, the points are taken to the nearest degree of latitude and longitude and put as sequential pairs in the DATA statements from line 5000 onwards. It is a good idea to split up the list with REM statements so that you can easily identify a part of the list and relate it to the corresponding area on the screen. The centre of the circle on the screen is at x=128, y=88 and the radius of the circle is 87 screen units. The constant z=87/90 gives the increment per degree of latitude. The equatorial circle and the N. pole are plotted by lines 40 and 100; thereafter the map is drawn in sections which call two routines at 1700 and 1800. For each section 'n' represents the number of

the point to be plotted. The routine at 1700 plots the first point in a group and the other routine at 1800 plots all subsequent points and links then by straight lines.

Both these routines call a routine at line 1500 which converts the latitude, stored in the array l(n), into a radius as measured from the N. pole. The longitude of the point is stored in the array a(n) and this has to be corrected as the zero for circle drawing on the Spectrum is at the 3 o'clock position whereas longitude is measured clockwise from the Greenwich meridian .. 6 o'clock position in our diagram. From these two measurements we can get the 'x' and 'y' screen displacements dx and dy as measured from centre screen. Hence we arrive at the x and y screen coordinates to be plotted ... lines 1500 to 1570. When it comes to drawing lines the Spectrum has only got a 'draw relative' command and one has to subtract p and q, the coordinates of the previous point, to get the relative distances.

All this is done fairly quickly by the computer and once the screen is drawn it can be stored on disc as a SCREEN$ to be recalled by a program as required. In my case I wrote a short program to plot a curved satellite track on the map once the EQX (equator crossing longitude) had been input by the user ... but that is another story!

For the next map I decided to take the area bounded by latitudes 30'N and 75'N and by longitudes 25'W and 40'E and a grid was drawn and stored as a SCREEN$ to be recalled by the map drawing program. A different set of DATA statements was compiled as described earlier. For this more detailed map it is best to record the values to the nearest tenth of a degree; unfortunately most maps are plotted in degrees and minutes. If you find difficulty in estimating to a tenth of a degree then it would be a simple matter to write a short program which would allow input in minutes and convert to decimal degrees. Clearly the same technique can be used to draw the actual map as was used for the previous program. You can see from fig 2 that there is area distortion in the northern latitudes.

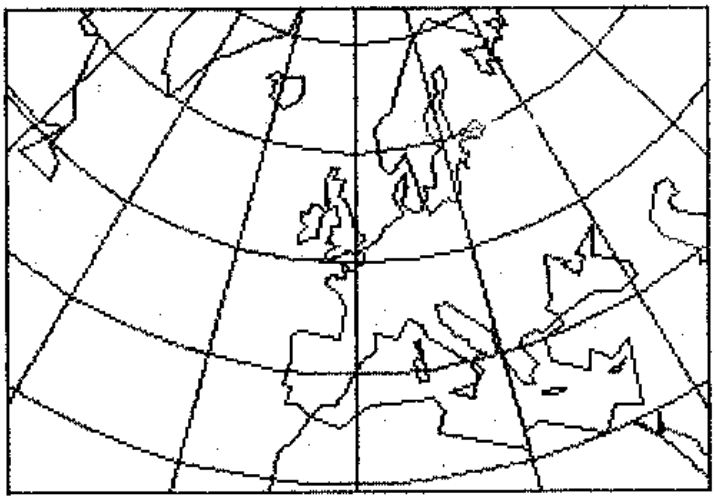

Fig 3.

At this stage I consulted my son who is a mathematician and he suggested transferring the data to a conic projection and he even wrote the portion of program to do this. The appearance of this map (fig 3) is much more realistic but there is a hidden snag when entering the latitude and longitude data. If the edge of the picture is a line of latitude or longitude, as in fig 2, then it is an easy matter to start or finish a coastline on the edge of the picture. In fig 3 when selecting points from the atlas there is no easy way to discover whether a point is going to be on the screen or not. To get over this difficulty I wrote a short routine and tacked it on to the end of the main program. This routine asks for an input of latitude and longitude and then prints out:-

Lat. Long. Screen x Screen y Flag

The Flag is 1 if the point is on the screen and 0 if it is over the boundary. I used this to check all doubtful points and then plot up to, but not beyond, the screen edge.

As the programs for figs.2 & 3 are rather long I am not going to ask our editor to publish them; as an alternative, if any Indug member is interested in this aspect of the hobby

I can provide these programs on 3 1/2 or 5 1/4 discs 80tr DSDD. You send the disc and £1.00 to cover post, packing and general hassle and I will supply the programs.

```
  5 REM "HEMIDRAW", by C.Grant DIXON
 10 CLS
 20 DIM A(235): DIM L(235)
 30 LET pi=3.14159: LET Z=87/90
 40 PLOT 128,88
100 CIRCLE 128,88,87
200 LET N=1: REM ..Europe & Asia
210 GOSUB 1700
220 FOR N=2 TO 119
230 GOSUB 1800
240 NEXT N
300 LET N=120: REM ..England & Scotla
    nd
310 GOSUB 1700
320 FOR N=121 TO 129
330 GOSUB 1800
340 NEXT N
400 LET N=130: REM ..Ireland
410 GOSUB 1700
420 FOR N=131 TO 134
430 GOSUB 1800
440 NEXT N
500 LET N=135: REM ..Iceland
510 GOSUB 1700
520 FOR N=136 TO 139
530 GOSUB 1800
540 NEXT N
600 LET N=140: REM ..Japan
610 GOSUB 1700
620 FOR N=141 TO 150
630 GOSUB 1800
640 NEXT N
700 LET N=151: REM ..America
710 GOSUB 1700
720 FOR N=152 TO 209
730 GOSUB 1800
740 NEXT N
800 LET N=210: REM ..Greenland
810 GOSUB 1700
820 FOR N=211 TO 219
830 GOSUB 1800
840 NEXT N
1000 STOP
1500 LET R=(90-L(N))*Z
1510 LET A=270-A(N)
1520 IF A<0 THEN LET A=A+360
1530 LET A=A*PI/180
1540 LET DX=R*COS A
1550 LET DY=R*SIN A
1560 LET X=DX+128
1570 LET Y=DY+88
1580 LET FX=X-P
1590 LET FY=Y-Q
1600 RETURN
1700 READ A(N),L(N): REM ..Initial pos
     ition
1710 LET P=0: LET Q=0
1720 GOSUB 1500
1730 PLOT FX,FY
1740 LET P=X: LET Q=Y
1750 RETURN
1800 READ A(N),L(N): REM ..Drawing rou
     tine
1810 GOSUB 1500
1820 DRAW FX,FY
1830 LET P=X: LET Q=Y
1840 RETURN
4999 REM ...Europe and Asia
5000 DATA 350,0,350,3,356,7,8,5,17,15,
     16,22,5,36,350,37
5010 DATA 349,34,341,30,337,32,326,30,
     324,36,333,36,333,39,326,41
5020 DATA 321,40,319,42,324,45,329,45,
     332,42,330,40,337,40,335,37
5030 DATA 337,35,340,39,343,45,345,43,
     342,37,345,37,345,35,346,40
5040 DATA 350,44,356,43,359,39,1,37,9,
     37,9,43,1,43,1,47
5050 DATA 4,48,358,50,352,53,351,56,34
     9,58,349,54,340,54,337,58
5060 DATA 331,60,338,60,337,65,342,61,
     340,59,346,56,349,59,352,58
5070 DATA 355,61,349,64,335,70,320,67,
     295,69,260,76,250,73,230,71
5080 DATA 190,70,174,65,190,60,198,60,
     200,53,205,50,205,55,202,61
5090 DATA 224,55,219,52,222,48,232,39,
     231,36,234,33,237,39,242,38
5100 DATA 238,30,242,24,250,20,254,18,
     251,12,255,8,260,12,261,9
5110 DATA 257,5,256,1,259,3,262,9,263,
     15,266,15,269,22,279,15
5120 DATA 280,11,282,8,287,18,287,21,2
     89,20,294,25,303,26,310,30
5130 DATA 312,28,308,24,304,25,301,22,
     305,17,316,12,320,20,325,28
5140 DATA 327,28,323,19,317,12,313,10,
     309,11,312,5,316,2
5149 REM ..England and Scotland
5150 DATA 358,51,6,50,2,52,4,53,2,55,4
     ,55,5,59,1,59,1,56,358,51
5159 REM ..Ireland
5160 DATA 6,52,6,56,9,55,10,50,6,52
5169 REM ..Iceland
5170 DATA 12,64,13,68,20,68,20,64,12,6
     4
5179 REM ..Japan
5180 DATA 218,45,220,41,218,38,221,34,
     225,33,229,33,225,36,222,38
5190 DATA 220,41,215,43,218,45
```

```
5199 REM ..America
5200 DATA 80,0,76,4,78,9,82,8,88,14,94
     ,18,105,20,112,32
5210 DATA 114,31,109,25,115,28,124,40,
     125,50,140,60,160,57,166,61
5220 DATA 162,64,169,66,162,68,170,70,
     160,72,136,70,100,68,84,70
5230 DATA 82,67,95,60,82,55,80,52,78,5
     5,78,63,70,62,67,58
5240 DATA 62,60,55,52,53,48,59,49,55,5
     2,68,48,62,48,62,46
5250 DATA 75,40,77,35,81,32,80,26,84,3
     1,89,31,98,28,95,20
5260 DATA 91,20,87,22,89,17,85,18,83,1
     5,82,10,75,11,71,13
5270 DATA 62,11,57,7,53,7
5279 REM ..Greenland
5280 DATA 42,60,39,66,22,70,18,82,50,8
     2,67,77,55,75,50,70
5290 DATA 52,64,42,60
```

There is a lot of scope for map drawing and I would be glad to hear from anyone who produces any other maps.. perhaps one of the U.K., or England. Happy mapping!!

C.Grant DIXON,
Kyrle's Cross,
Peterstow,
ROSS-on-WYE,
HR9 6LD.

NEV'S HELP PAGE

By: Nev Young.

Mr G E McLean of Stenhousemuir (I can see there from here!) thinks he has a problem with the DISC ORGANISER from BETTERBYTES. He says that when he tries to copy a snapshot he gets the message 'UPDATE GDOS VERSION 3A' although other file types copy OK. The problem is that the ORGANISER uses the system command 'SAVE d1 "file1" TO d2 "file2"' and as you should know the DISCiPLE and PLUS D will not copy snapshot, mdfile or opentype files this way.

If you use this as a direct command you will get the error message 'File NOT FOUND' but the ORGANISER traps errors so it is not reportd. Instead the program continues with the next line of basic which just happens to be the error report that you have the wrong version of GDOS. If the copy had worked then the system would have done a reset and never got that far.

What is needed is an error message on line 6389 of the ORGANISER something like:-

```
6389 PRINT #1; AT 1,0;"Can not copy th
     at type of file": GOTO 20
```

Now you have the problem of trying to break into the program to insert this new line. I am told that you can do this by going to the RENAME FILE option and trying to rename any file as "Zx". This should give a STOP and return you to basic. Now type in the line EXACTLY as shown (and best in 48K mode) then type:-

SAVE d1"AUTO-ORG" LINE 7500.

WARNING DO NOT EDIT ANY OTHER LINES AS THEY ARE PROTECTED AND CAN NOT BE CHANGED WITHOUT DESTROYING THE PROGRAM

A quick way of making a copy of a snapshot file is:-

1. Load the snapshot and immediately press the snaphot button.
2. Swap discs.
3. Press the key to take a new snapshot.

J Murphy of Mitcham has raised the question of disc cleaning. He has a cleaning disc, which the instructions say, should be run with both heads loaded for 10 seconds. He worries that the head on side two may not be in contact unless he does something like a FORMAT command and that lasts for more than 10 seconds. So now a few lines on keeping your heads clean.

There are two types of head cleaning disc, dry and wet & dry. The only difference is that with wet & dry you put some cleaning solution onto the disc first. (nb this is usually isopropyl alcohol or similar. DO NOT use water / washing up liquid / gin etc. Not only will they not work they will cause irrevocable damage to your drive).

Once you have put the cleaning disc into the drive it should be run for the recommended time usually 10 - 30 seconds. This can be done by just doing CAT 1. On all the 5 1/4 and 3 (1/2) inch drives both heads load at the same time so you do not need to select side two for a double sided disc.

The only problem with this is that you are always using the same part of the cleaning disc an it will soon lose its potency. It is far better to move the heads across the disc to use the full cleaning area. This can be done by trying to FORMAT the disc or by sending stepping commands to the drive. A simple BASIC program to do this is given below.

It must also be remembered these

cleaning discs are for preventing damage to your drive heads. They will not cure a damaged head so use your cleaning disc regularly.

****

Disc cleaning program

```
10 LET COM = 27: REM USE 227 ON PLUS D
20 OUT COM,8
30 FOR T= 0 TO 79
40 OUT COM,88
50 NEXT T
60 FOR T= 0 TO 79
70 OUT COM,120
80 NEXT T
```

****

C.Nobes of Hullbridge has 3 questions:

1. How can I SAVE/LOAD along the lines of INPUT "name of program" LINE A$: LOAD/SAVE d1 A$ CODE

2. Why did my machine suddenly start to do a CAT in red

3. Where can I get something to gold plate the edge connector

Answers:-

1. INPUT "Enter file name ";A$
   LOAD d1;A$ CODE

   Note you need a ; between the d1 and the A$. Also if you want to change a file name this way use

   ERASE d1;a$ TO ;b$

2. Dunno. Glastnos perhaps?

3. You read that in the January issue of FORMAT on the letters page. The company is SCOTCADE phone 0274 578043. I don't know how good it is. Perhaps you could let the rest of us know how you get on.

Mr P Clough would like to know if he can connect a Spectrum +2 to his video recorder to title videos. I certainly don't know of any special software for that job (but I'm sure somebody reading this will). As for connecting to the video you can do it very simply indeed. Just plug the UHF lead from the Spectrum into the video and tune it in like any other TV channel. The only problem you might encounter is that the Spectrum and the video may be tuned to the same channel and would interfere with each other. It should be possible to retune your video (see your handbook or TV dealer).

This would enable you to make video recordings of the spectrum screens but you would need special hardware to enable you to do any smart things like superimpose over another recording but these can best found in the specialist video magazines and are beyond the scope of this page.

A quick note here about videos and poor picture quality. I had it when I first got my Spectrum and it was caused by having both the compter and the video on a the same time. They were both tuned to channel 36 and so interfered with each other. After retuning everything was fine.

Thats all for this month. Remember If you don't write to me I can't write this page. I also have to point out that I can not answer questions personally so DO NOT send me return postage etc. I will attempt to answer as many queries as possible but only through the magazine.

Write to FORMAT or directly to me at:-

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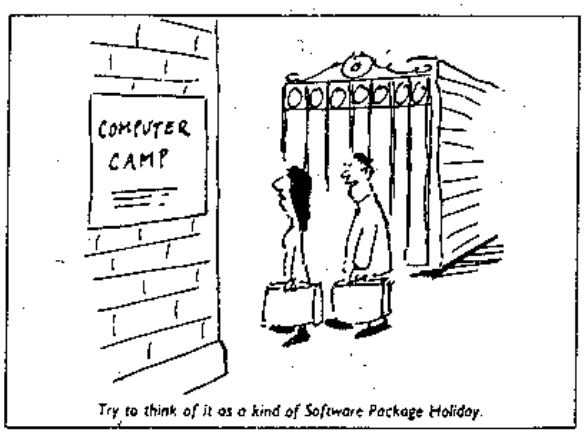

Try to think of it as a kind of Software Package Holiday.

DISCiPLE ANATOMY

By: Dick Guy.

This month we take a look at the printer interface and joystick circuits.

I am sure that the majority of you will be aware that any data to be printed ends up in character form, as a byte in the accumulator. There are several ways by which this data byte can be output to the printer port, the most familiar of which is the LPRINT command on the keyboard.

The byte, be it character or printer control code, eventually finds itself on the DATA bus and, as a result of whichever output instruction we use to print it, appears on the input pins of IC11. This particular IC is known as an OCTAL tri-state D type bi-stable, this is a mouthful so will require explaining.

Octal, as no doubt the majority of you will know, means 8. In this case it means the chip handles 8 bits.

Tri-state we met last month and stems from the computer world requirement to have more than 1 integrated circuit attached to a particular bus at a time. An example of this is the Z80 and memory chips. They all share the address, data and control buses and if all were active at the same time, a problem known as contention would arise. Tri-state solves the problem. What exactly is it, I hear you ask. We are all aware that our data bits have 2 states, 0 and 1, making bi-state. The third state is where these bits are not allowed access to the bus when not required. When an output stage is tri-state it's as if a switch had been opened and the output is no longer connected to the bus, indeed as far as other devices connected to the bus are concerned, the tri-stated device does not even exist.

Bi-stable simply means, as you will have guessed, 2 stable conditions. The D type bit means the circuit configuration the IC is built to.

Right, back to the circuit. IC11 is used as a latch, that is any data on its input pins can only get to the output pins following a control signal. This signal I have called CLOCK, though more accurately it is a STROBE, to save confusion with the printer control signal of that name. Once the data byte is latched in, there it stays on the output until a further CLOCK signal arrives. Why you may be asking. It is so that the DISCiPLE control system can get on with other things such as asserting the STROBE line which tells the printer a data byte is ready for it. As soon as the strobe line goes low (active), the printer collects the byte from the output port of your DISCiPLE then does nothing, it just sits and waits..., most printers that is. The vast majority of printers have what is known as a character BUFFER where all the data to be printed is collected. Normally the printer will only print the data on to paper following certain definate conditions. The most important of these is a carriage return (CR). I do not intend getting into how printers work here but evidently the printer needs to tell the DISCiPLE that it still awaits more data or a CHR$ (13), before it will do any thing. This handshake signal is BUSY and as it is not asserted (active high) the DISCiPLE software repeats the above description and eventually we get a printout.

The DISCiPLE implementation of the CENTRONICS interface is not to full standard (very few computers use the full standard) but is more than sufficient for most parallel printers. A few details for you. The theoretical

PRINTER AND
JOYSTICKS
CIRCUIT
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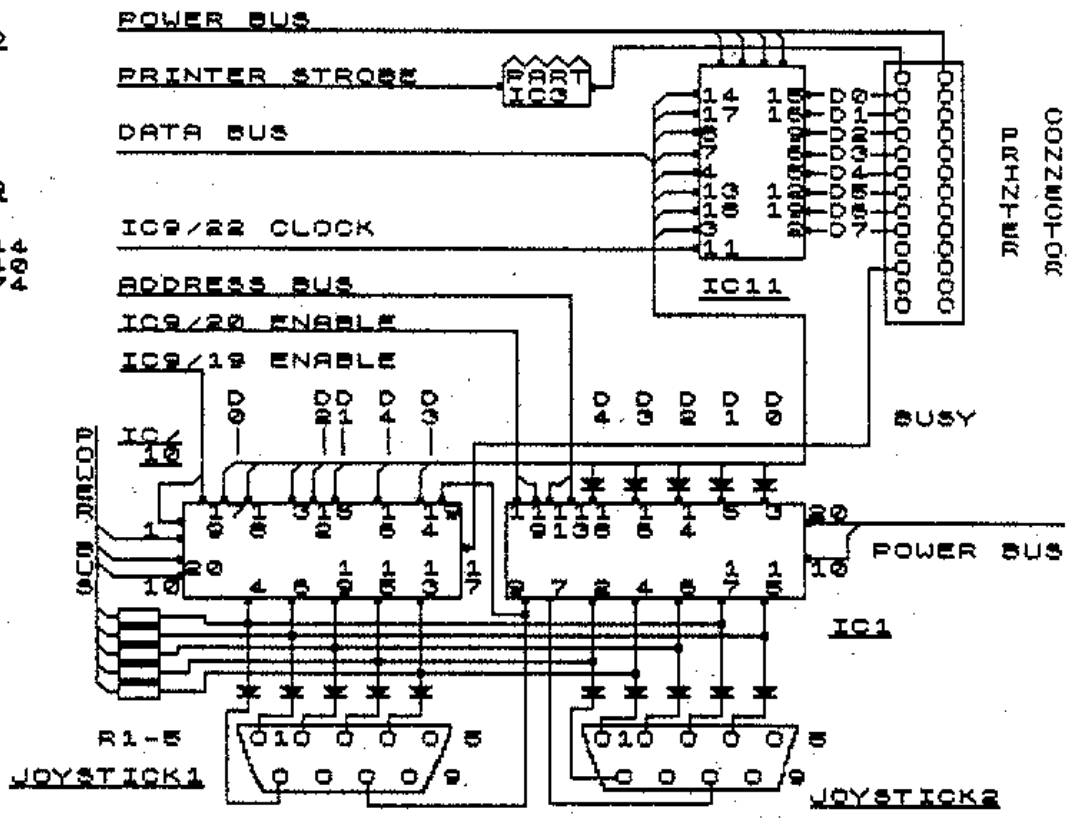
IC 1 74LS244
IC10 74LS240
IC11 74LS374
ALL DIODES
1N4148
R1-5 2K2



maximum length of the printer cable is 2 meters. Any greater and a problem known as 'skew' arises. Skew is where data bits arrive at the printer at different times. Some simple tests on my interface shows that the full alphabet can be sent to the printer in about 10 milleseconds (1/100 sec). This equates to a transfer rate of about 2,600 characters per second. The fact that most printers print 150 characters or less per second proves the need for the BUSY line.

The joystick circuit comprises the remainder of the circuit. Although it may look complicated it is a fairly straight forward way of giving access to some key board functions.

The address connections to IC1 are A11 and A12. Those of you who know the Speccy keyboard will be aware that the same address lines are used for the top row of keys on the standard 48K machine. IC1 and 10 are both OCTAL tri-state buffer drivers with IC10 also being an inverter. The tri-state function on all IC's in this circuit are disabled.

The DISCiPLE reads the joystick switches by pulling the appropriate address line low. If no joystick is connected or in use the data lines (D0-D4) will all be high as a result of R1-5. IC's 1 and 10 are enabled in turn and the data lines checked. As the controlling software knows which IC is enabled it can tell which joystick port is in use. With the joystick in use the appropriate data line is pulled low and from this the switch in use can be determined. The diodes are there to isolate various functions from each other. The function of the joystick port connections are as follows:-

Pin	Port 1=key	Description	Port 2=key
1	8	down	3
2	9	up	4
3	6	left	1
4	7	right	2
6	0	fire	5
8		common	
5,7 & 9		no connection	

The right hand joystick is also mapped onto the Kempston standard port (I/O address 31). Try running a program that constantly prints the result of **IN 31** as you wiggle the stick.

Thats it for now. Next month we will look at the DISCiPLE's RAM and ROM.

COLOUR DUMPING

A REVIEW AND AN EXPANSION

By: Villy Feltman.

To be a foreigner (i.e. not an Englishmen) gives you 2 choices in getting original software for your Spectrum either to buy it at the local importer which is 30-100% more expensive than in England (but with delivery in a few days) or you order it from England by mailing a cheque and then wait patiently for a month to receive the software. On this occasion I ordered it locally and received it 2 days later on a 3.5" disc, bad luck - I only have a 5.25" drives.

Back to the agent who told me that MGT only deliver it on 3.5" disc unless you state otherwise when ordering, but my supplier transferred it to cassette without any extra charge to me and a week later I had the program in my hands.

The program consists of 2 parts, a basic program and the code for doing the colour dump to the printer. The instructions are just a single side of A4 photocopy paper which looks like it has been copied for the fifth time.

LOAD "" and both parts of the program are transferred to the disc. Then up on the screen comes a menu which asks you to change the colour numbers as required for your printer. A quick look on the screen told me that the colour number for black was wrong, it said 8 and the correct number according to the printer manual was 0. I changed it and kept the rest of the colour numbers as stated. The program then saves your version on to disc and stops. What now? well when everything else fails read the instructions!

I did so, aha now its clear, now it was time to load the CODE file back, then the screen to be printed and RANDOMIZE USR 49160. Great colourfull picture on the printer but the black colour was missing! This event is just to point out the weakpoint of the program, it is not user friendly. You have to know that the colour numbers on the menu screen are for use in the machine code and not for sending to the printer and also that zero means zero colour on the paper. And why doesn't the program ask you for a name of a screenfile and then print it on the printer? instead of this LOAD this :LOAD that : RANDOMIZE USR 49160 (which could have been shortened down by making the CODE autorun). You have to do that now every time a new picture has to be printed. And thirdly, the program is advertised as beeing only for the PLUS D, but the DISCiPLE runs it just as well.

The program is for the use with the STAR LC-10 COLOUR printer but can be used with other colour printers which use EPSON command codes. The program's parts are small but don't let that fool you, when Bruce Gordon did the coding he put a good deal of thinking into the machine code part, which has made it compact, smart and fast. It prints a picture of the size 2x2 of the screen size (twice the size of a normal SCREEN$(1) dump) and lets it be printed with a left margin on the paper and turned the right way up as well, making it possible to have 2 pictures on one piece of A4 paper. It takes approximately 5 minutes to get the picture printed and that's because the printer isn't any faster.

Do I recommend the program? yes indeed, it is one of those programs that you have to have, if of course you have a colour printer too. The price for the program in Denmark is 179kr, which is about £14 and that's far too much! In the UK you should be able to get it cheaper from MGT.

Overall Rating 8/10. (for the coding)

Right, thats the review over, so let's move on and look at how to make the Colour Dump program even better.

There is, in my opinion, the possibility for multiple dumps, dumps of different size, and the use of other printer interfaces (we aren't all lucky enough to have a DISCiPLE or PLUS D.

Last things first, obviously you have to get the program on cassette if you don't have a DISCiPLE/PLUS D. To other printer-interfaces you will need to open stream 3 and use the RST10 instruction instead of the command code (#39) which the program uses. To make the 1x1 dumps means just a slight alteration to the machine code. To make the dump 3 to 1 or A4 size is a much bigger step, more like a new piece of code and that isn't the purpose of this article. The multiple dumps is easy to do by adding extra lines to the basic part of the program.

All the above alterations will be done by the basic program at the end of this article.

And now to the exciting bit!

1. Merge the basic by MERGE "" , stop the tape when the O.K.message appears

2. Enter CLEAR 49151 as a direct command

3. Load the code part by LOAD "" CODE.

4. Enter the basic program below, leaving out the lines marked REM #3 if you don't need to OPEN# 3 i.e. if you want your PLUS D or DISCiPLE to run the printer.

5. Change the LOAD & SAVE commands to fit your storage system if you don't have a PLUS D or DISCiPLE.

6. Enter RUN 4000 as a direct command, this saves the program and code and then RUNs it so you can try it out.

7. Happy printing .

THE NEW BASIC.

```
 10 CLS #: BORDER 6: PAPER 6: INK 0
 15 LOAD d*"col code"CODE 49152
 16 POKE 23658,8: LET n=1
 20 INPUT "Do you want to change :"'
    "Colour options look-up table"''"
    Size of copy"''"Numbers of copies
    "''''"Or to"''"Print a picture"''"
    End session"'''a$
 30 IF a$="C" THEN  GO TO 100
 35 IF a$="S" THEN  GO TO 300
 40 IF a$="P" THEN  GO TO 400
 45 IF a$="E" THEN  STOP
 50 IF a$="N" THEN  INPUT "How many c
    opies do you want";n
 60 CLS : GO TO 20
100 LET n=49152: PRINT AT 0,0;"Screen
     colour to  Printer colour"
105 PRINT AT 3,18;"Black   =8";AT 5,1
    8;"Blue    =2";AT 7,18;"Red     =
    1";AT 9,18;"Magenta =3";AT 11,18;
    "Green   =6";AT 13,18;"Orange  =5
    ";AT 15,18;"Yellow  =4"
110 PRINT AT 3,0;"Black  =";: GO SUB
    1000
111 PRINT AT 5,0;"Blue   =";: GO SUB
    1000
112 PRINT AT 7,0;"RED    =";: GO SUB
    1000
113 PRINT AT 9,0;"Magenta=";: GO SUB
    1000
114 PRINT AT 11,0;"Green  =";: GO SUB
     1000
115 PRINT AT 13,0;"Cyan   =";: GO SUB
     1000
116 PRINT AT 15,0;"Yellow =";: GO SUB
     1000
200 SAVE d*"col auto"CODE 49152,280
210 GO TO 16
300 INPUT "which size ?"''''1:1"''"2:
    1"''''s
310 POKE 49216,s: POKE 49311,8/S
320 RESTORE 3000+s: POKE 49176,8/s: F
    OR s=0 TO 23: READ d: POKE 49249+
    s,d: NEXT s
330 GO TO 60
400 CAT *!: INPUT "Name of the pictur
    e ?"'a$: LOAD d*;a$SCREEN$ : FOR
    p=1 TO n: RANDOMIZE USR 49160: NE
    XT p
410 GO TO 60
1000 INPUT "What colour on printer 1-8
     ";c: POKE n,c: PRINT c: LET n=n+
     1: RETURN
2000 LOAD ""CODE 49152: CLS : PRINT "P
     lace disc in drive one and     pr
     ess enter": PAUSE 0: SAVE d1"col
```

```
      change" LINE 10: SAVE d*"col code
      "CODE 49152,265: RUN 10
2050  SAVE "col change" LINE 2000: SAVE
       "col code"CODE 49152,265
3000  REM size 1:1
3001  DATA 0,0,0,0,241,58,3,193,23,50,3
      ,193,36,124,230,7,32,212,58,3,193
      ,0,0,0
3002  REM size 2:1
3010  DATA 23,50,3,193,241,58,3,193,23,
      50,3,193,36,124,230,3,32,212,58,3
      ,193,205,236,192
4000  POKE 49160,205: POKE 49161,11: PO
      KE 49162,193: REM #3
4010  POKE 49389,215: POKE 49390,0: REM
       #3
4020  RESTORE 4030: FOR A=49419 TO 4942
      7: READ D: POKE A,D: NEXT A: REM
      #3
      4030 DATA 62,3,205,1,22,33,0,64,2
      01: REM #3
4040  REM USE OF #3 WITH THE DISCiPLE O
      R +D NEED A POKE @6,1
5000  CLS : PRINT "Place disc in drive
      one and       press enter": PAUSE 0
      : SAVE d1"col change" LINE 10: SA
      VE d*"col code"CODE 49152,280: RU
      N 10
```

VILLY FELTMAN

Editors Note: Villy will be back soon with a follow-up to his sucessful conversion of OCP Art Studio. Yes! the much demanded Advanced Art Studio comes under the converters knife.

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- + - + - + -

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RADIO SPECTRUM

By: Paul Newman (G4INP).

Hello! Welcome to the first of what I hope will be an instructive occasional series. Most of you won't have come across my name before so I'll make a brief introduction. My name is Paul Newman and I've been a radio amateur since 1973 when I was licensed as G8HUU and later as G4INP. I first became involved with computers in amateur radio when the Sinclair ZX80 appeared and have "computerised" most amateur applications on micros ranging from the ZX80 through to an IBM-PC compatible.

In 1981 I formed SARUG - now called the Sinclair Amstrad Radio User Group; some of you may have seen this mentioned in a recent FORMAT.

Can I firstly set some ground-rules? They'll make life easier for us all. I'm happy to receive letters with questions, suggestions and items for inclusion in this spot, and these should be sent to me at the address below. If you want a personal reply then enclose return postage (overseas, valid International Reply Coupons). No postage = no reply; if it didn't I'd go broke!

I know some folk find writing letters hard but I'm sorry I cannot take 'phone calls; my number is ex-directory and no, Bob won't give it to you! When writing please describe your problem briefly but as accurately as possible; please don't send any magnetic media. Please don't ask me to recommend amateur-radio equipment. As you will soon become aware, amateur radio is a complex hobby with a multitude of variations. Consequently, it's a very personal hobby and this means making your own choices based on as much information as possible.

Amateur radio is one of a small number of activities governed by Act of Parliament - the Wireless Telegraphy Act. A City & Guilds Certificate (No.55) is required before anyone can legally own an amateur transmitter. Be warned - mistakes in this area can be expensive in both monetary and personal terms, sounds of morse-code dots and dashes, the raucous chatter of slow-scan television and facsimile and all the other odd noises?

These all represent one thing. Communication. Amateur, commercial, political; by speech, codes and pictures. From all corners of the earth. And most of them can be decoded by your humble Spectrum.

Well lets not get carried away just yet! We've got some problems to overcome first. Ever tried putting your Spectrum next to a transistor radio? Thats called interference! And it will scramble all your attempts to get the Spectrum to decode anything. So we'll look at that problem first.

From experience, I can safely say that some of you will experience no such problems - you're just plain lucky - some Spectrums are quite silent in this respect. If you can sit your Spectrum near the receiver - fine. But remember to keep the TV away from the receiver and route all wires away from one-another.

If you get various whistles and general "sharsh" in the receiver (remember to tune it from one end of its coverage to the other of course - with NO antenna) then switch the Spectrum off. Noise goes away? Yes - then you've got problems - sorry!

Now try connecting the Spectrum "ear" socket to the audio output from the receiver. WARNING - if its an old valve receiver or has no suitable

socket then you will have to devise an electrically safe audio output. I can't help with this since it will depend upon the receiver design. If the noise in the receiver increases with this test, then its likely to be coming down the audio lead.

The cure lies in a bit of dogged persistence and tracking down the cure for you. It won't be the same cure as the guy up the road, though, be warned.

Try different positions for the Spectrum in relation to the receiver. Coil the audio lead from micro to receiver around a ferrite rod or slab. Lengthen/shorten the lead (this did it for me - I used a very long lead!). If you understand what decoupling the lead at either end means, then do so.

If you have a cased Spectrum then perhaps it can be lined with tinfoil or sprayed with conductive paint. These work well. Projects for screening a +2 and a plastic (original design) cased Spectrum 48K have been published in SARUG as has a project for an "ear" socket on the +2. These projects are within the range of anyone competent with their hands and careful in approach.

In the direst of cases it might be necessary to stop the clatter at source. This means screening the coils on the Spectrum printed circuit board. In early Spectrums the "chroma" circuitry was the main culprit. But this is for the adept and adventurous amongst you. DON'T ask me to steer you through it - if you don't understand, don't even think it!

Metal-cased Spectrums will probably be less prone to problems in this direction due to the screening effect of the case.

You may need to ensure that your receiver is properly earthed. If you are using a metal-cased monitor then try earthing its case. If you are using a TV-set then (provided you KNOW what you are doing!) measure the voltage across the two conductors of the TV-computer video lead after disconnecting from the computer. If the voltage is below about 1 or 2 volts, fine; if not, you may find that a braid-break will cure the problem. (Consult a radio technician if you don't understand this bit.) Alternatively, try a different TV if possible.

That draws our first offering to a close. I'll be back with you in a forthcoming issue (if Bob will have me!) when we shall look at some simple ways of decoding Morse Code, Radio Teletype (RTTY) and some of the related, but more exotic, modes.

Until then, may your interference grow less!

References.

1. Radio Society of Great Britain, Lambda House, Cranbourne Rd, Potters Bar, Herts EN6 3JE.

2. Paul Newman G4INP, 3 Red House Lane, Leiston, Suffolk IP16 4JZ.

ADVENTURE CORNER

By: Paul Rigby.

I have always said that the Adventure Corner is, or should be, modelled around and by the readers of Format. Which is why I am, this month, returning to my favourite person, Phil Glover, and his letter (first mentioned a couple of issues ago). There were a couple of topics aired by Phil that I did not have room to discuss in that particular instalment.

Phil had some comments about adventure authors and software houses. He asks if they could, "...get together and settle on some agreements on adventure terminology! I get confused with all the various options with regard to saving games, for example RAMSAVE, RAM SAVE, RS, SAVE TO "M" (memory), SAVE TO "T" (tape), MEMSAVE and so on. I wish they'd agree on one word or abbreviation (I'd favour RAMSAVE and RS). I wish they'd take a vote on it (with the big boys perhaps) publish a leaflet, and send it out with each game."

Interesting point that. There does appear to be a wide variety of commands for, relatively few, operations. Because adventure games have grown in a rather haphazard fashion there has been no real base structure. So you have not, as you will find in a number of other computer related subjects, come across any "Industry Standard" commands, as it where. Individual software houses have always spouted that their new, earth shattering adventure creation system is the best, revolutionary, etc. It seems inevitable that a new set of commands should come with this "new" system. Maybe the software house concerned feels that it needs to break the ties from the past in every situation so it may of adopted different ways of calling up the same command purely as a result of pressure from the Marketing Department.

But that's the rub. A set of common commands, across the board, may be sensible to programmers and designers in large software houses. However, you also have many other personalities within a large software house who have no connections with adventure games as such, but who may not see it as a good idea. Maybe they would see a set of common standards as a threat to the software houses individualism. Every large software house wants to be seen as to be taking the lead, being the "King of the Castle", setting standards for the rest to follow. There is also the factor that large software houses might not consider adventure game important enough to warrant the effort of achieving a common set of standards. Adventure games, it has to be said, are not money spinners any more. Ask anyone connected with Infocom, for example. The shift of research, time and effort seems to have focused upon RPGs of the DungeonMaster-type. Games with outstanding graphics, sound, AI routines and so on. WIMP interfaces, menu driven games, etc appear to hog all of the attention. So why should large or medium size software houses bother to standardise on text input commands?

Now, moving down (or is it up) to the home-grown adventure author/ enthusiast I can see some justifacation to the possibilities of standardisation. I suppose this idea would refer back to the possibility of setting up an adventure association consisting of small software houses and individual authors. Such an association could implement a set of standards which could be followed by

all association members. The standards would only cover a set of basic and general commands but, I am sure, everyone would benefit. A set of rules recommending that the inventory, within an adventure, must be accessed by inputting "inventory", "inven", "inv" and "i", for example. How often I have seen adventures which only accept one or two of those options, even of recent release. Other frustrating examples are adventures which only accept "exami" for "examine" instead of accepting "exam" which is used by the majority of other authors.

Moving on, Phil gives some suggestions for the future content of Adventure Corner, "With regard your ideas for Adventure Corner I'd certainly be keen on reading more reviews, tips and a beginner's guide to writing adventures. I think that the more you can find out about various aspects of a hobby the more you can appreciate and enjoy it."

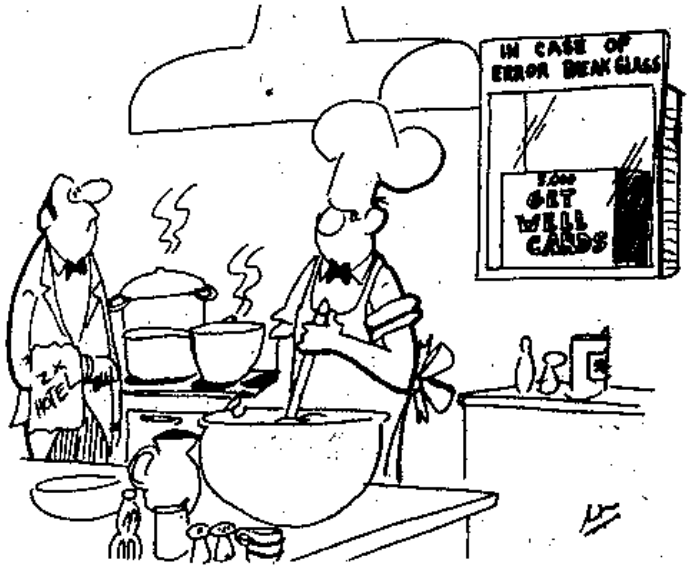
When Adventure Corner was first conceived my illustrious Editor and I discussed the content and future policy of it. We thought adventure columns were becoming rather stale and just a bit too similar for comfort. In an effort to inject some life into the adventure column we thought that replacing reviews, tips and so on with discussions on adventure related topics would be a good direction to take. I have, with the exception of the PAW related products recently reviewed, intentionally avoided doing game reviews and a hint/tips section. However, that does not mean that adventures, for example, will not be reviewed, on an occasional or regular basis. What is needed, however, is more kind souls, such as Phil Glover, to write to me indicating in what direction they would like to see the column moving. It would be erronous of me to implement all of Phil's suggestions, no-matter how sensible. Merely because he is one reader. For all I know everyone else may prefer a totally different content. Please write in with your preferences and suggestions.

The last suggestion advocated by Phil is as follows, "Any chance of asking Format readers if they have old adventures that they no longer need? There must be quite a lot of adventures that are "out of print" that newer adventurers cannot get anymore. Maybe the classified page is the place to try for swaps, etc." Well? What do you think? If you have any adventures that you would like to swap or sell, especially those items that are deleted, then please send your advertisement to the classified section. This is an ideal way of obtaining those adventures that have disappeared from the shop shelves. Also it is a good way to obtain those adventures which have only been sold via mail-order and have only been advertised in one, obscure magazine, for example. Adventures like this are easily missed. In addition, it is also an excellent way to meet new friends. I have heard, many times, of new friendships springing up from the simple action of two complete strangers swapping adventures. Adventurers, being such nice people anyway, striking up friendships is not difficult.

Finally, I would like to switch from "ramblings" to "wonderings". Something for you to chew on, as it where. If you have not had the opportunity to try, then maybe you have heard of Infocom's relatively new system of including on-line hints within the adventure. Basically, this involves pressing a function key, or whatever, to access the system. You are then presented with an excellent "nested" system of hints so it is impossible to see every answer at once as you can when you are scanning a solution. Key words are presented to you, initially, which highlight potential areas of difficulty. Once you select that keyword you are placed into a secondary menu which branches into a more selective area (say, the kitchen or problems with the wild dog). Hints may be presented which, if selected, will reveal a little bit more of the answer, and so on. To my mind, this system of help is far better than reading a solution in a magazine or

even reading a direct hint (because the Infocom hints are graded so you may see a vague hint, then a stronger hint, etc). It is also far cheaper than telephoning or sending for help by letter - it is also far quicker. So what is he on about now? You may ask. Well I just wondered if it could be feasible for adventure authors and/or small software houses to do something similar. Possibly as an extra, additional product, which could be purchased at a nominal cost or placed on the flip side of the cassette for nothing. Maybe even inserted as an on-line system, as Infocom have done, although I think memory would be the master in this case. Possibly, if such a system would not prove feasible for one adventure, established authors and software houses, could publish an on-line hints tape for their latest adventure and a series of older adventures, for those players new to their games. Some authors have a back catalogue of five or ten adventures. One tape could cover every adventure. It could even be updated on a regular basis. Is such a scheme pie in the proverbial sky? Is it a possibility? What do you think? Write to me care of FORMAT on this or any other subject.

See you next month.



THE SECRETS OF WORD MANAGER

SPECTRUM MACHINE CODE MADE EASY

Part 7. **By: Francis Miles.**

INTERRUPTS. - Part 1.

WORD MANAGER is an unusual machine code program because it runs for the most part with the interrupt disabled. This makes it possible to use the user interrupt mode, IM 2, to run the "slow print" operation simultaneously with other functions of the program.

WORD MANAGER contains a system variable IRRP, which is set to zero when the program is loaded, and a subroutine IRR which is called as soon as it enters the machine code program, and at other times whenever it may be necessary to adjust the interrupt:

```
2240 IRR    EQU $
2250 ;Adjust the interrupt.
2260        LD A,(IRRP)
2270        AND A
2280        JR Z,IRR1
2290 ;IRRP is not zero. Set interrupt
2300 ;to call "print byte" routine.
2310        LD A,254
2320        LD I,A
2330        IM 2
2340        EI
2350        RET
```

[The effect of IM 2 is that every time the interrupt fires - which is fifty times every second - the chip stops running themain machine code program and jumps to an address determined (mainly) by the I register. If I holds 254, as in this case, which is FE hex, it jumps to whatever address it finds in FExx hex, where xx is determined by the hardware. In fact, plugging peripherals into the Spectrum can change the value of xx; to cater for this possibility, WORD MANAGER puts FD in every address from FE00 to FF00 inclusive (257 addresses). This ensures that whatever xx may be, the jump is made to FDFD, which holds the command JP PTYPE.]

```
2360 ;IRRP is zero.
2365 ;Disable interrupts.
2370 IRR1   IM 1
2380        DI
2390        RET
```

[DI disables (switches off) all the interrupts; EI enables (switches on) whichever was specified last. IM 1 is specified here (although disabled) so that if the program jumps back into BASIC it need only command EI. IM 1 is the interrupt used in normal Spectrum running. It jumps every fiftieth of a second to location 56, the keyboard scanning routine.]

The "DI running" of WORD MANAGER has various minor side-effects. For example, a few ROM routines, specifically the BEEP routines and the cassette SAVE/LOAD routines, disable the interrupt while they do their thing, and then enable it again before RET; so each time WORD MANAGER uses these it must CALL IRR afterwards to disable it once more. And HALT can't be used with the interrupt disabled, it unfortunately halts_for_ever, although it works OK on interrupt mode 2. Perhaps the most interesting side-effect is in the INP routine, which waits for a key to be pressed and returns with the character code in A. In my other programs (including Address Manager II and Mail Manager), which run without disabling the interrupt, this routine is quite simple, though a little baffling at first sight:-

```
INP         LD (IY-50),0 ;LAST.K
INP.0       LD A,(IY-50)
            AND A
            JR Z,INP.0
            RET
```

[LAST.K is one of the ROM system variables. See my forthcoming article on "Flags and system variables".]

This looks as if it would go endlessly round the INP.0 loop; and indeed it will do so until you press a key on the keyboard. For IM 1 is interrupting the loop 50 times a second to check the keyboard, and if you press a key it will put the character code in LAST.K, which breaks out of the loop.

In WORD MANAGER things are a bit more complicated, because as soon as the program goes from BASIC into machine codethe interrupt is disabled, and stays disabled till the program goes back into BASIC - except when it's "slow printing", when a different interrupt is switched on which doesn't check the keyboard. So the INP subroutine has to do the keyboard check for itself:-

```
1450 INP     EQU $
1460 ;Input from keyboard.
1470 ;Zero LAST.K.
1480         LD (IY-50),0
1490 ;Scan keyboard till key pressed.
1500 INP.0   RST 38H
1510         HALT
1520         LD A,(IY-50)
1530         AND A
1540         JR Z,INP.0
```

[RST 38H calls the "keyboard scanning restart", which checks the keyboard and if legitimate keys are being pressed puts the corresponding character code in LAST.K. The HALT in line 1510 is there for a complicated reason to do with interaction with the "slow print interrupt", which I won't go into. HALT hangs up if the interrupt is disabled, but RST 38H enables the interrupt before returning, so there is no problem here; however the interrupt must be disabled again. This is done at the end of the subroutine, after "click", which uses the BEEP routines and therefore enables the interrupt again.]

```
1550 ;Click.
1560         PUSH AF
1570         LD HL,800
1580         LD DE,3
1590         CALL 949 ;BEEPER
```

[There are two ROM routines which can be called from machine code to make a BEEP; the other one is 01016 BEEP. Both of them require tedious calculations to determine the pitch and duration of the beep, and I frankly use trial and error; this 949 BEEPER has simpler inputs.]

```
1600         CALL IRR
```

[The interrupt has been enabled both by RST 38H and by BEEP. IRR sets it back as required.]

```
1610         POP AF
1620         RET
```

The WORD MANAGER routine actually called by IM 2 is PTYPE, which sends a single byte to the printer. If the user selects "fast print", ie he wants the printing done as fast as possible and will wait till it's finished before doing any more editing, the interrupt is not used: execution goes into the loop:

```
4390 FAST    CALL PTYPE
4400         JR FAST
```

which merely calls the "print a byte" routine endlessly. But there is an escape within PTYPE, as we shall see later. If the user selects "slow print", printing is actually done more slowly, but it is done by the interrupt, so the main program menu returns and the user can proceed with editing another text while it is still going on.

```
4410 ;Slow print.
4420 SLOW    ...
```

[I skip here a number of routines which transfer the text to a special print buffer, clearing it out of the text buffer which the user will be editing with another text.]

```
5020 ;Start the interrupt.
5030         LD HL,IRRP
5040         LD (HL),1
```

```
5050        JP ABT
```

All this does is make IRRP non-zero. What happens at ABT?

```
0050        ABT EQU $
0060 ;Return to main menu.
0070        LD SP,(MSSP)
0080        JP MAIN
```

Not much, apparently. Look further at MAIN:

```
0150 MAIN   EQU $
0160 ;Main sequence.
0170 ;Save stack pointer and
0175 ;set interrupt.
0180        LD (MSSP),SP
0190        CALL IRR
```

MAIN is the entry point for the whole machine code program, entered when the program is first run, each time it is reentered from BASIC after a Microdrive command has been executed, and at several other points in the machine code where a jump is made to ABT. After making various adjustments, it prints out the main menu and waits for an input.

The first two adjustments are important here:-

1. It puts the stack pointer address in a WORD MANAGER system variable MSSP. This is what is called back in ABT (line 0070). It means that the program can jump to ABT, without clearing the stack, from any point whatever, even from inside nested subroutines; the stack pointer is put back to its original position where it was when the machine code started to run. The chip will "forget" everything on the stack and start again at the menu.

2. Because we made IRRP non-zero (in line 5030 of SLOW), CALL IRR restarts the program with IM 2 operating. So fifty times a second, each time the interrupt fires, the computer breaks off its normal execution and calls PTYPE.

I will describe PTYPE in next month's article.

On a NEW KEY.

By: Carol Brooksbank.

It was Bob Brenchley and Steve Nutting's "Plus D Patch" in Format Vol. 2 no. 10 (June '89) that started me thinking how useful I would find another extra key on the snapshot button.

I use true A4 paper, which has 70 lines per page. I have set up my "+system" file to send this page length to the printer - which is fine until I reset the printer for some reason. You will have gathered from my articles that I do a lot of graphics work using screen dumps. Every time I decide to abort a screen dump which is obviously going to be useless, I leave the printer stuck in graphics mode, and the only way out is to switch it off and on again, whereupon it stubbornly resets itself to 66 lines per page.

So when this happens, I have to break out into BASIC, then POKE @ 6,1, and LPRINT CHR$ 27; "C"; CHR$ 70;. This is irritating at the best of times, and doubly so if I am working with a program like Art Studio, which doesn't let you break into BASIC. So I thought how useful it would be to press the snapshot button, press a key, and have the page length codes sent to the printer. This is the program which does it.

I will explain exactly what is involved, because I suspect you may like to add some extra facilites of your own - perhaps in addition to or instead of my printer codes routine.

Steve and Bob, in their Plus D patch, called a routine of their own from a point in the middle of the snapshot button keycheck routine. I cannot do that in exactly the same way, because I find their patch extremely useful and I don't want to overwrite it or the call to it.

So I am making use of one of the Plus D system variables at address 8353. This is POKE @161, and for clarity I will call it that from now on.

This address is called repeatedly from the snapshot keycheck routine while waiting for a key to be pressed, and it, in turn, jumps to a routine at 8469. So, if we make POKE @ 161 jump to another address, where we have our own routine for checking for key 6 and sending codes to the printer if 6 is pressed, we shall have added a new key to the snapshot button's capabilities.

If key 6 is not pressed, our routine will jump to 8469, the routine to which the operation is normally directed by POKE @ 161. The stack will already hold the correct return address from the call to POKE @ 161. If key 6 is pressed, our routine will send the codes and then jump to the point in the snapshot key routine after key "X" is detected - the exit point. But this time we shall have to remove the unwanted return address, from the call to POKE @ 161, from the stack.

The check for key 6 is by reading the input port. I find this much easier to explain in hex, so I hope our illustrious Editor (who doesn't like hex), will bear with me for a paragraph or so.

The low byte of the port address is always 254 (FE hex). The high byte depends on which half-row of keys you want to read, and will be:-

<u>Left side of keyboard.</u>

CAPS SHIFT - V = 254 = FE hex
A - G = 253 = FD "
Q - T = 251 = FB "
1 - 5 = 247 = F7 "

Right side of keyboard.

```
B - SPACE = 127 = 7F hex
H - ENTER = 191 = BF  "
Y - P     = 223 = DF  "
6 - 0     = 239 = EF  "
```

To check for one particular key, you check bits 0-4 of the byte input from the port. Bit 0 is always the key nearest the outside of the keyboard, and bit 4 the key nearest the centre. So on a left side half-row, bit 0 is the left (first) key and on a right side half-row, bit 0 is the right (last) key. If the bit is set, that key has been pressed.

So, to check for key 6, we load B with EF hex (the high byte for keys 6-0) and C with FE hex (the low byte for a key reading input port). This gives us the BC register holding EFFE hex, which is 61438 decimal (EF = 239; FE = 254; 239 x 256 + 254 = 61438). We read the byte into E, and check bit 4.

The only other problem is sending the codes to the printer. We cannot use the familiar method of opening channel 3 and sending the byte in A to the selected channel by RST 16, because the DOS ROM is paged in at that point, and although you can call Spectrum ROM routines while the shadow ROM is paged in, this particular method of sending bytes to the printer does not work reliably from the shadow ROM. So we use a call to DOS ROM address 5577, which sends the byte in A to the printer.

And that explains the machine code routine, apart from the fact that we save the registers before executing it, and restore them afterwards.

The final problem is, how to get the machine code into the PLUS D RAM? There is plenty of spare space in the PLUS D, because it was developed from the DISCIPLE DOS, and the Disciple networking routines have been left out. A convenient place to start is 12640 (3160 hex), because it will not overwrite Steve and Bob's key 0 patch, which is at 12781. So, if you are using an assembler, ORG to 12640, but for the time being, assemble the code at 50000, and:-

```
SAVE d1"key6code" CODE 50000,48
```

then

```
LOAD d1"key6code"CODE 12640
```

This will place the code in the shadow RAM. Finally, to enable it, you must POKE @162,12640 Note that the address is POKEd @162, because the byte at POKE @161 is the jump instruction.

SAVE d1"+sys" CODE 8192,6656 will save your altered system file to disc. I hope that this article will help you to see how easily extra facilities can be added to the snapshot button. There is about 2K of space in the PLUS D RAM to play around with, but if you are using Bob and Steve's patch, you must avoid addresses 12781 - 12797. So, it's over to you - and I hope you will share your ideas for extra snapshot features with the rest of us.

CODE POKER

```
 10 CLEAR 49999
 20 LET C=50000
 30 FOR X=0 TO 47
 40 READ A
 50 POKE (C+X),A
 60 NEXT X
 70 DATA 245,197,213,229,1,254,239,237
 80 DATA 88,203,99,32,14,33,138,49
 90 DATA 6,6,126,205,201,21,33,16
100 DATA 249,24,7,225,209,193,241,195
110 DATA 21,33,225,209,193,241,225,195
120 DATA 178,0,27,64,27,67,70,13
130 SAVE d1"key6code" CODE 50000,48
140 LOAD d1"key6code" CODE 12640
150 POKE @162,12640
160 SAVE d1"+sys" CODE 8192,6656
```

THE SOURCE CODE

```
 10         ORG 12640
 20 ;stack registers to save current
 21 ;state if key 6 not pressed.
 30 START   PUSH AF
 40         PUSH BC
 50         PUSH DE
 60         PUSH HL
 70 ;check if key 6 is pressed.
 80         LD BC,61438
 90         IN E,(C)
100         BIT 4,E
```

45500 to 61

```
110 ;jump forward if it isn't.
120         JR NZ,NOTSIX
130 ;key 6 pressed, so point HL at
131 ;codes to send.
140         LD HL,CODES
150 ;number of codes to send.
160         LD B,6
170 ;fetch the next code to send.
180 OUTPUT  LD A,(HL)
190 ;DOS call sends  A reg to printer.
200         CALL 5577
210 ;point to next code & loop back
211 ;if more codes to send.
220         INC  HL
230         DJNZ OUTPUT
240 ;exit if there aren't.
250         JR DONE
260 ;key 6 not pressed so restore.
270 NOTSIX  POP HL
280         POP DE
290         POP BC
300         POP AF
310 ;continue with normal snapshot key
311 ;checks at address normally called
312 ;by "@161".
320         JP 8469
330 DONE    POP HL ;balance stack
340         POP DE
350         POP BC
360         POP AF
370 ;remove return address for call to
371 ;"@161" from stack and jump to
372 ;exit from snapshot routine.
380         POP HL
390         JP 178
400 ;codes reset printer and set paper
401 ;length to 70 lines (true A4).
410 CODES   DEFB 27,"@",27,"C",70,13
420 END     EQU  $
430 LENGTH  EQU  END-START
```

HACK-ZONE

By: Hugh J. McLenaghan.

Hello and welcome to another Hack-Zone. I'm sorry there was no Hack-Zone last month, this was due to not being sent anything. If no-one sends me anything or asks questions, then I cannot write for that month.

Now on with this month's hacks. To start with I have a conversion for 'Xcel' by Mastertronic. This conversion was sent in by Mr R.G.Newton of Glensoft. This game uses ROM calls and is impossible to snap, so here is how to convert it to disc.

Xcel

First you must type in the following BASIC loader:-

```
1 PAPER NOT PI: BORDER NOT PI: CLEAR V
  AL "65535": LOAD d*"XCEL1" CODE: RAN
  DOMIZE USR VAL "24000": PAUSE VAL "5
  0": LOAD d*"XCEL2" CODE: PRINT INK 9
  ; AT 10,5;"Press  Inhibit button";A
  T 11,6;"Then press any Key": PAUS
  E NOT PI: OUT 31,0: RANDOMIZE USR VA
  L "39584"
```

Save this to disc with:-

```
SAVE d*"Xcel" LINE 1
```

Now clear the memory with:-

```
RANDOMIZE USR 0
```

Now type the following and start the tape:-

```
CLEAR 65535: LOAD "" CODE
```

After the O.K. message comes up stop the tape and save by typing:-

```
SAVE d*"Xcel" CODE 24000,12000
```

Then type LOAD "" CODE and start the tape once more.

Again when the O.K. message appears, stop the tape and type:-

```
SAVE d*"Xcel2" CODE 25000,40000
```

You now have a converted copy of Xcel. You can test it by typing:-

```
LOAD d*"Xcel"
```

Now for a little bit of programming. I have rewritten the Poke-Finder program in Vol 3 - 1. This program was written in basic and searched out possible pokes for infinite lives etc. It is now written in machine-code and delivers the numbers in seconds, instead of minutes. Here it is:-

POKE-FINDER

```
 10 REM  Poke-Finder
 20 REM  Written by Hugh J.McLenaghan
 30 REM
 40 CLS
 50 INPUT "Where would you like the p
    rogram stored? ";add
 60 FOR a=add TO add+58
 70 READ z: POKE a,z: NEXT a
 80 PRINT "To use type  RANDOMIZE USR
     ";add
 90 STOP
100 DATA 221,33,0,91,221,126,0,254,33
    ,40
110 DATA 13,254,58,40,35,221,35,221,1
    24,221
120 DATA 181,32,237,201,221,126,3,254
    ,53,32
130 DATA 240,62,2,205,1,22,221,229,19
    3,205
140 DATA 43,45,205,227,45,62,13,215,2
    4,221
150 DATA 221,126,3,254,61,40,230,24,2
    12
```

That's all for this month. Please, PLEASE, send your POKEs, Hacks, Conversions and of course your Conversion Problems to me - I need them to keep Hack-Zone alive.

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